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ABSTRACT

Competence is a set of knowledge, skills, and behaviors that must be owned, internalized, and mastered by lecturers in carrying out their duties as their profession. The qualifications of lecturers are very necessary to convey knowledge and skills so that students have competencies in accordance with the demands of the rapidly developing world of work. Aspects of competency that need to be possessed by lecturers are pedagogic competence, professional competence, personality competence and social competence. Through these dimensions an assessment or evaluation can be carried out that can be used to improve competence in supporting performance in the teaching and learning process. Lecturer Achievement Index (LAI) has the goal to determine how much teachers can provide good teaching method accordingly to students, where a professor is expected to become a professional in the field. The purpose of this study is to assess the competence of lecturers four relationship patterns, namely pedagogical, professional, social and personality using clustering Partial Least Square (PLS). The results obtained are personal competence, professional competence and social influence on pedagogical, using Response Unit Based Segmentation (REBUS) PLS, student perceptions regarding LAI grouped into three segments (Very Good LAI, Good LAI, Pretty Good LAI) based similarity

indicators to the model. Each segment (local model) shows the value of R^2 and Goodness of Fit (GOF) is better when compared to PLS (global model). IPD excellent models based on the perceptions of students affected by the pedagogic competence with clarity indicator delivery of content and answers to questions in class, regularity and lecture order according to schedule and influenced by professional competence with indicators of ability to give relevant examples of concepts taught, ability to provide motivation to students, ability to explain the relevance of material taught in the context of life.

Key words: Competence, Pedagogic, Professional, Social, Personality, Structural Equation Modeling.

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1. INTRODUCTION

Human Resources (HR) competence these days have been discussed a lot, and what's interesting to see is the issue of educater competence. As an important part of producing quality human resources through the education process, educators need to have competencies that can support the teaching and learning process. RI Law No. 14 of 2005 concerning Teachers and Lecturers stating that an educator needs to have competence. Competence is a set of knowledge, skills, and behaviors that must be owned, internalized, and mastered by the teacher or lecturer in carrying out his professional duties.

Sudemajat (2004) provides signs about the meaning of competence, as ownership of knowledge (basic scientific concepts), skills needed to complete a job in the field, and values and attitudes. Competency has three dimensions: (1) acquisition of the concept, (2) the skills to apply the concepts, and (3) the maintenance of the values and attitudes of the concept of controlled and implementation. Law No. 14 of 2005 concerning Teachers and Lecturers contains aspects of competence that need to be possessed by lecturers, namely pedagogic competence, professional competence, personality competence and social competence. Through these dimensions an assessment or evaluation can be carried out that can be used to improve competence in supporting performance in teaching and learning activities (Dya et al., 2016). LAI aims to find out how much lecturers can provide good teaching methods according to students, where a lecturer is expected to become a professional in his field. Professional Indonesian lecturers / teachers are required to have a strong knowledge base as a solution to the technological community and the scientific community. With the professionalism requirements of lecturers or teachers, a new paradigm is needed to give birth to a professional profile of Indonesian lecturers / teachers who have a mature and developing personality, where the longer the teaching lecturer will be able to develop the potential that exists because he has more experience (Ridwan, 2007).

Competence is ability, expertise, authority and power. The Government through RI Law No. 14 of 2005 concerning Teachers and Lecturers, Chapter I article 1 paragraph 10 defines competence as a set of knowledge, skills, and behaviors that must be possessed, internalized, and mastered by the teacher or in carrying out professional duties. Republic of Indonesia Government Regulation Number 19 of 2005 concerning National Education Standards, Article 28 states that: education must have academic qualifications and competencies as agents of learning, physically and mentally healthy, and have the ability to realize national

education goals. Whereas according to the provisions of Law No. 14 of 2005 concerning Teachers and Lecturers, teacher professional competencies are divided into four, (1) pedagogical competencies, (2) personality competencies, (3) professional competencies and (4) social competencies. Pedagogic competence is specified as the ability (a) to understand students, (b) the ability to plan, implement, and assess learning, and (c) the ability to develop students. Personality competencies are specified to be stable and stable, wise, authoritative, and noble character. Then professional competence is specified to master the scientific field of study and critical study of the deepening of the contents of the field of study. Furthermore, social competence is specified as the ability to communicate with students, colleagues, and the community (Basri, 2003).

Sulendar (2009) states that social competence influences personality competence and professional competence influences pedagogic competencies. Raduwan (2007), Dya et al., (2016), about the performance of lecturers using path analysis and SEM methods concludes (1) professional competence directly contributes and is significant to performance lecturers. (2) work motivation directly contributes and is significant to performance lecturers. (3) simultaneously professional competence and work motivation contribute significantly to performance lecturer. So it is necessary to do research that develops a simultaneous teaching model based on four (4) lecturer competencies, according to what is stated in Republic of Indonesia Law No. 14 of 2005 concerning Teachers and Lecturers. The purpose of this study is that the constructs of the research are as follows, (1) the higher the level of professional competence and social competence possessed by the lecturer the higher the teaching competency (pedagogic). (2) the higher the level of conformity between the professional competency of the lecturer and personality competence (personality), the higher the teaching competency (pedagogic). (3) the higher the level of conformity between the lecturer social competence and personality competence (personality), the higher the pedagogical competence. SEM has the ability to involve many variables and explain causality relationships between variables that contain multiple relationship relationships. SEM at the beginning of its development is covariant based which requires normal multivariate assumptions, observations must be independent, the number of samples used must be large (Bollen, 1989; Hair et. al., 2006; Mangkoedihardjo, 2006, 2007; Mulaik, 2009; Tabachnick & Fidell, 2007; Raykov & Marcoulides, 2006; Santadro et al., 2011). To overcome assumptions that are not fulfilled, use SEM-based variants or Partial Least Square (PLS). PLS, not based on the number of assumptions such as data do not have to be multivariate normally distributed, indicators with category, ordinal scales, interval to ratios can be used on the same model, and samples do not have to be large (N Rusdi et. al., 2018; Wibisono et. al., 2018; Anekawati et. al., 2017; Rodiyah et. al., 2016; Wold, 1985).

SEM there is a presumption that the sample used comes from a homogeneous population. Whereas in a study if the population that is the object of research is not homogeneous it will make the estimation of the resulting model less precise. Additionally, in a study using SEM involves many variables and indicators, as well as the use of secondary data taken from different sources can lead to heterogeneity. Some approaches used to detect heterogeneity in SEM, are Finite Mixture Partial Least Square (FIMIX-PLS) and Response Based Unit for Segmentation Partial Least Square (REBUS PLS).

Methods related to latent variables namely Confirmatory Factor Analysis (CFA) (Brown, 2006; N. Rusdi et. al., 2014)) and Structural Equation Modeling (SEM) (Mulaik, 2009; Raykov & Marcoulides, 2006; Hair et. al., 2006; Bollen, 1989). Research related to PLS, among others: Ghozali and Latan, (2013); N. Rusdi et. al., (2018), moderating entrepreneurship at corporate reputation in business Performance using Partial Least Square. Widyasari (2004) who conducts competency development research. For Organizational

Performance Improvement. Wibisono et.al., (2018), PLS for Performance Assessment of Teaching workloads by moderating Motivation of Emotional Intelligence. Afifah, (2014), uses FIMIX to detect heterogeneity in the structure of poverty models in Central Java. REBUS-PLS was developed by Trinchera (2007); Vinzi et.al., (2008); Mehmetoglu, (2011); and Fosso and Trinchera, (2014). Whereas Zanin, (2011), uses REBUS PLS to detect heterogeneity in the relationship between well-being and individual satisfaction.

This study wants to examine how students' perceptions of lecturer achievement indexes are proxied by the influence of social, professional and personality competencies on pedagogic competencies (Dya et. al., 2016; Fahruddin, 2007). In this study also wants to detect the heterogeneity of the lecturer achievement index model by applying the Response Based Unit for Segmentation Partial Least Square (REBUS PLS).

2. RESEARCH METHODOLOGY

Data collection techniques were carried out using a questionnaire and supported by observation (Sugiyono, 2004). The respondents were students Bisnis Administration study program that has taken the odd semester. The latent variable used is four lecturer competencies (pedagogic, professional, social, and personality). This study uses a probability sampling method, where each element in the population has the opportunity or possibility to be selected as a sample. The probability sampling used is simple random sampling. The research variables used include 4 latent variables and 20 indicators , namely Social Competence (Soc_C1 , Soc_C 2, Soc_C 3, Soc_C 4, and Soc_C 5), professional competence (Prof_C1 , Prof_C 2, Prof_C 3, Prof_C 4, and Prof_C5), personality competence (Pers_C 1, Pers_C 2, Pers_C 3, Pers_C 4, and Pers_C 5), and pedagogic competence (Ped_C1, Ped_C2 , Ped_C3, Ped_C4 and Ped_C5) (Dya et. al., 2016; Riduwan, 2007). Framework research concept as follows.

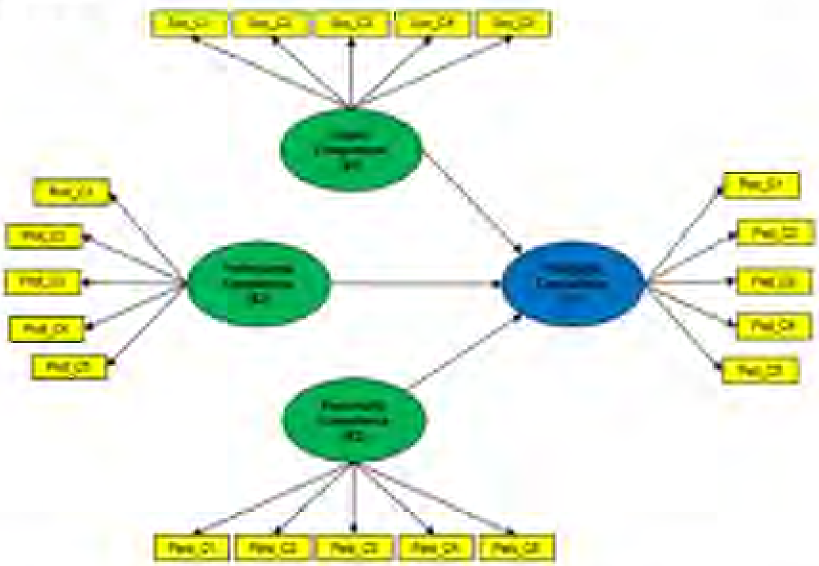

Figure 1. Conceptual framework of social, professional and personality competencies towards pedagogical competencies

The research analysis step consists of two stages, namely the first model analysis with SEM-PLS, and the second uses REBUS. More detailed analysis is as follows.

1. Structural Equation Model Partial Least Square (PLS SEM)

Structural equation modeling (SEM) is a collection of statistical techniques that allow a set of relationships between one latent variable and other latent variables and between latent variables and variables the indicators fulfill the assumption (Mulaik, 2009; Hair et. al., 2006). In the beginning, SEM was based on *covariance*, but it developed with *variance* -based SEM, namely PLS. PLS SEM is a powerful analytical method because it can be applied to all data scales, does not require many assumptions and sample size does not have to be large (Anckawati et. al., 2017; Rodliyah et. al., 2016; Wold, 1985). The path analysis model of all latent variables in PLS consists of three sets of relationships, namely the measurement model (*outer model*), structural model (*inner model*) and weighting relations (*weight relation*).

The measurement model can be described by two equations that determine the relationship between latent variables and endogenous manifests and between latent variables and exogenous manifests. Evaluation of the PLS model can be done by multi-process, namely by evaluating the outer model or measurement model which is the relationship between observed variables and latent constructs. Then proceed with evaluating the inner model or structural model that shows the relationship between latent constructs hypothesized.

2. REBUS PLS

REBUS-PLS is an iterative algorithm that can group or segment an observation unit while estimating the parameters of each *local model* in the formed segment. REBUS-PLS can produce a *local model* that is different from the *global model* in both the structural model and the measurement model. REBUS-PLS does not require assumptions of distribution on either the manifest variable or the latent variable.

REBUS PLS algorithm is a measure of closeness or what is called a *closeness measure*. According to Vinzi et al. [7] to see the distance between a unit and a model is to use *closeness measure index* (CM index), which is a structure of the *goodness of fit index* (GOF) calculated from the *residual model of community*. The steps of the REBUS PLS algorithm are as follows:

Step 1: Estimating the PLS Model with the path scheme (Anckawati et.al., 2017)

Step 2: Calculate structural and communal residuals from all units of the PLS model

Step 3: Form a hierarchical cluster based on structural and communal residuals calculated in step 2.

Step 4: Select the number of segments (S) based on the dendogram obtained from step 3.

Step 5: Group each case into segments according to cluster analysis

Step 6: Estimating the model in each segment (*local model*)

Step 7: Calculate the CM *measure closeness* for each case on each *local model*.

Step 8: Group each case on the *local model*

If stability is reached for members of the THEN segment to step 9 ELSE returns to step 6

Step 9: Describe the class obtained according to differences between *local models*.

3. RESULTS AND DISCUSSION

The first step taken in the REBUS PLS algorithm is to estimate the model with ordinary PLS SEM (hereinafter referred to as the *global model*) and the next step calculates structural and communal residuals from all units of the PLS model. In this section, will directly discuss the main results of the analysis of p engaruh social competence, professional and personality to the dimensions of human development using BOILED PLS algorithm.

The analysis of the results of the REBUS PLS analysis consists of heterogeneity in structural equations, model equations and evaluation models.

Figure 2. Model Competency social, professional and personality competencies towards pedagogical competencies

The global model path coefficient can be presented in the following structural equations:

$Y = 0.354\ X1 + 0.302\ X2 + 0.255\ X3$

with,

X1 : Social Competence

X2 : Professional Competence

X3 : Personality Competence

Y : Pedagogic Competence

Next, compare the path coefficient and critical ratio values generated in the global model, segment 1 model, the segment 2 model and segment 3 model are presented in the following table 1.

Table 1. Value of *Path Coefficients* and Critical Ratio of LAI Model

Variable Exogen → Variable Endogen	Global Model		Segment Model 1 (n1 = 30)		Model Segment 2 (n2 = 42)		Segment Model 3 (n3 = 28)	
	Value	Critical Ratio	Value	Critical Ratio	Value	Critical Ratio	Value	Critical Ratio
Social Competence → Pedagogic Competence	0.354	6.500	0.627	11.512	0.405	7.436	0.264	4.847
Professional → Pedagogic Competence	0.302	5.640	0.481	8.987	0.226	4.223	0.452	8.445
Personality → Pedagogic Competence	0.255	4.098	0.118	1.893	0.417	6.690	0.506	8.118

Based on Table 1, the interpretation of each path coefficient in each LAI model is as follows:

Global Model

It appears that pedagogical competencies are influenced by social competence, professional competence and personality competencies. The dominant influence on social competence, b a1 is visible from the path marked positive coefficient of 0.354 to the critical value ratio of 6.501 is greater than t table = 1.96. Thus, social competence significant effect on pedagogical competence, while professional and personality competencies each have an influence of 0.302 and 0.255 on pedagogic competencies.

Segment 1

Consisting of 30 students, which shows that Pedagogical competence is influenced by social competence and professional competence. The dominant influence on social competence, b a1 is visible from the path marked positive coefficient of 0.627 to the critical value ratio of 11.512 is greater than t table = 1.96. Thus, social competence has a significant effect on pedagogical competence, and professional competence has an effect of 0.481 on pedagogic competence. Whereas personality competence does not affect pedagogical competencies because the ctrical ratio value is 1.893 smaller than t table = 1.96.

Segment 2

Consisting of 42 students, which shows that pedagogic competence is influenced by social competence, professional competence and personality competencies. The dominant influence on personality competence, this can be seen from the path coefficients that are positive at 0.417 with the critical value ratio of 6.690 greater than t table = 1.96. Thus personality competence has a significant effect on pedagogical competencies, while professional and social competencies each have an effect of 0.405 and 0.226 on pedagogical competencies.

Segment 3

It consists of 28 students, which shows that pedagogic competence is influenced by social competence, profeissional competence and personality competencies. The dominant influence on personal competence. Thus, a visible from the path marked positive coefficient of 0.506 to the critical value ratio for 8.118 is greater than t table = 1.96. Thus, personality competence has a significant effect on pedagogical competencies, while professional and social competencies each have an influence of 0.264 and 0.452 on pedagogical competencies.

The comparison of the value of Standardized loadings in the measurement equation for the calculation of PLS SEM *(global model)* in each segment formed with REBUS PLS is presented in the following Table 2.

This standardized loading (loading factor) value is the magnitude of the correlation between each indicator (manifest variable) and its latent variables (for reflexive models). An indicator is said to have good validity if it has a value of loading factor ≥ 0.5. Almost all manifest variable loading factor values have a value of ≥ 0.5, except in segment 2 in the social competency variable with the Opinion ability indicator (Soc_C1) and the ability to accept criticism, suggestions, and opinions (Soc_C2) has a loading value of < 0.5. The difference in the loading factor values of each manifest variable in each segment formed, indicates the difference in strength / magnitude of the relationship between the manifest variables and their respective latent variables. This is indicating that each segment has a behavior different.

Table 2. Value Standardized Loadings LAI Model

Latent variable	Manifest variable	Loadings			
		Global Model	Segment Model 1 (n1 = 30)	Segment Model 2 (n2 = 42)	Segment Model 3 (n3 = 28)
Social Competence (X1)	Ability to express opinions (Soc_C1)	0.623	0.709	0.384	0.680
	Ability to accept criticism, suggestions, and opinions (Soc_C2)	0.587	0.621	0.431	0.847
	Get to know the students who attend the course (Soc_C3)	0.818	0.851	0.760	0.887
	Have a sense of humor (Soc_C4)	0.837	0.750	0.856	0.836
	Tolerance to student diversity (Soc_C5)	0.797	0.630	0.801	0.879
Professional Competence (X2)	Ability to explain material appropriately (Prof_C1)	0.700	0.709	0.798	0.549
	Ability to give relevant examples of concepts taught (Prof_C2)	0.757	0.684	0.819	0.755
	Ability to explain the relevance of material taught in the context of life (Prof_C3)	0.686	0.814	0.619	0.442
	The ability to admonish wisely, clearly and firmly (Prof_C4)	0.772	0.767	0.880	0.838
	Ability to provide motivation to students (Prof_C5)	0.887	0.906	0.840	0.854
Personality Competence (X3)	Authority as a lecturer person (Pers_C1)	0.850	0.897	0.775	0.829
	Wisdom in making decisions (Pers_C2)	0.863	0.897	0.865	0.865
	Become an example of behaving and behaving (Pers_C3)	0.826	0.845	0.844	0.809
	Consistent in speech and action (Pers_C4)	0.688	0.602	0.477	0.821
	The ability to control yourself in various situations and conditions (Pers_C5)	0.901	0.967	0.875	0.859
Pedagogic Competence (Y)	Readiness provides lectures and / or practice / practicum (Ped_C1)	0.858	0.909	0.767	0.740
	Regularity and lecture order according to schedule (Ped_C2)	0.816	0.891	0.681	0.696
	Ability to turn on class atmosphere (Ped_C3)	0.857	0.847	0.853	0.765
	Clarity of material delivery and answers to questions in class (Ped_C4)	0.828	0.910	0.734	0.567
	Use of media and learning technology (Ped_C5)	0.669	0.688	0.723	0.557

To evaluate the structural models, in view of R-square value (R2) and goodness of fit (GOF). Briefly presented in the following table 3.

Table 3. Value of R^2 and GOF of LAI Model

Latent variable	Model			
	Global	Segment 1	Segment 2	Segment 3
R^2	0.477	0.922	0.744	0.625
GOF	0.871	0. 967	0.879	0.818

The value R^2 indicates the goodness of the model in explaining based on empirical data. Table 3 shows that the value of R^2 on the local become larger models, while to test overall model used goodness of fit (GOF). GOF is a single measure used to validate the combined performance of the measurement model and structural model. In table 5, it can be seen that

the GOF value for each local model is greater than the global GOF value except in the segment 3 model.

Furthermore, each clustering case on a local model can be distinguished based on the mean value of each latent variable, especially in pedagogical competence variables. The following is the mean value of each latent variable and indicator each model.

Table 4. Mean Value of Latent Variables in the LAI Model

P	Manifest variable	Mean					
		Segment Model 1 (n1 = 30)		Model Segment 2 (n2 = 42)		Segment Model 3 (n3 = 28)	
Social Competence (X1)	Soc_C1	3.935	4.052	3.943	3.993	3.921	4.048
	Soc_C2		3.803		3.812		3.804
	Soc_C3		3.685		3.898		3.855
	Soc_C4		3.937		3.940		3.775
	Soc_C5		4.137		4.074		4.123
Professional Competence (X2)	Prof_C1	3.760	3.975	3.707	3.633	3.858	3.859
	Prof_C2		3.956		3.607		4.079
	Prof_C3		3.650		3.830		3.845
	Prof_C4		3.730		3.721		3.637
	Prof_C5		3.489		3.743		3.869
Personality Competence (X3)	Pers_C1	3.781	3.907	3.772	3.833	3.697	3.468
	Pers_C2		3.634		3.754		3.819
	Pers_C3		3.629		3.854		3.662
	Pers_C4		3.909		3.756		3.574
	Pers_C5		3.827		3.661		3.960
Pedagogic Competence (Y)	Ped_C1	3.783	3.887	3.455	3.369	3.794	3.864
	Ped_C2		3.718		3.404		3.848
	Ped_C3		3.784		3.542		3.669
	Ped_C4		3.769		3.317		3.943
	Ped_C5		3.758		3.554		3.645

Table 4 shows that the 3-segment model is perceived as a model with excellent LAI with mean pedagogical and professional competencies of 3.794 and 3.858 respectively, the 1-segment model is perceived as a model with good LAI, while the 2-segment model is perceived as a model with LAI is quite good. Indicators that distinguish between segments:

Segment - 1: Good LAI

Perceptions of students with LAI are both formed by pedagogical competencies with Readiness indicators giving lectures and / or practice / practicum (Ped_C1), Ability to revive the classroom atmosphere (Ped_C3), Use of media and learning technology (Ped_C5) and influenced by personality competencies with Consistent indicators in speech and actions (Pers_C4), authority as a lecturer person (Pers_C1), by social competence with indicators of tolerance for student diversity (Soc_C5), ability to express opinions (Soc_C1), ability to accept criticism, suggestions, and opinions (Soc_C2), as well as professional competence with the ability to explain the material correctly (Prof_C1), the ability to admonish wisely, clearly and firmly (Prof_C4).

Segment - 2: Good LAI

Perceptions of students to LAI pretty well formed by the social competence with indicators Have a sense of humor (Soc_C4), familiar with the students who attend lectures (Soc_C3),

and is shaped by personal competence indicator becom example in attitude and behavior (Pers_C3).

Segment - 3: Very Good LAI

Student perceptions with LAI are very well formed by pedagogic competencies with clarity indicators delivering material and answers to questions in class (Ped_C4). Regularity and lecture order according to schedule (Ped_C2) and influenced by professional competencies with Ability indicators to provide relevant examples of concepts taught (Prof_C2). Ability to provide motivation to students (Prof_C5). Ability to explain the relevance of material taught in the context of life (Prof_C3).

4. CONCLUSIONS

Based on the results of the analysis and discussion some conclusions were obtained:

- the measurement model on the global model meets the criteria of validity and reliability and has the appropriate GOF value, the overall model is fit.
- the application of REBUS PLS to the model of the influence of social competence, professionalism and personality on pedagogical competencies, obtained segmentations of units of observation, which indicated that there was heterogeneity in the global model.
- The model formed through the application of REBUS PLS, is grouped into 3 segments, namely the segment with the perception of LAI is very good, good and quite good. The perception of students with LAI is very well formed by pedagogical competence and is influenced by professional competence. The perceptions of students with LAI are both shaped by pedagogical competencies and are influenced by personality competencies and professional competencies. The perception of students with LAI is quite well formed by social competencies and personality competencies.

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